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Secondary epileptogenesis in the immature brain: A role of GABA

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Abstract

Clinical studies show that the probability of recurrent epileptiform discharges and formation of an epileptic focus (epileptogenesis) in young children is much higher than in adults. Repetitive epileptiform discharges and their potential contribution to the mechanisms of the development of the epileptic focus - an important object of clinical and scientific research. This review is based on the data from animal studies, and summarizes the current understanding of the mechanisms underlying the increased excitability of the immature brain, the formation of a secondary epileptogenic focus, and the functional changes of neurons due to deleterious effects of repetitive epileptiform discharges on the excitation and inhibition in the immature neuronal networks. The review discusses the relevance of experimental data in light of the general mechanisms of epileptogenesis in infants and identifies the gaps in current scientific knowledge, including the relationship between the data obtained in animal studies and processes underlying human acquired epilepsy.

Keywords

Epilepsy, Epileptiform discharges, Hippocampus, Immature brain, Mirror focus, Secondary epileptogenesis